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ABSTRACT

An ethnographic study examined the personal and professional life experiences that contributed to a science teacher's beliefs about science and science teaching, and how these experiences interacted to affect the teacher's decisions about content literacy strategies. The teacher in question was a veteran of 16 years of teaching chemistry and mathematics at Taft High School, located in a mid-size midwestern town. Data were collected over an 18-month period. Primary data sources were seven formal, semi-structured interviews and daily informal teacher interviews. Results indicated that the personal and professional experiences and values that shaped the teacher's beliefs about science, science teaching, and using literacy activities can be described by the theme "doing what's right." As the teacher recounted her experiences, she talked of caring, respect, guidelines, and organization. She chose teaching and learning strategies because she believed that by helping students learn how to learn, she was "doing what was right" for her students. She chose literacy strategies that fostered organization in science thinking and learning. Findings suggest that pre-service and inservice teacher education programs should ask teachers to construct "autobiographical selves" to perceive and evaluate the complex factors that may influence their classroom decisions, and that educators need to closely examine the context of teachers' (and students') lives to make changes in education. (Contains 33 references.) (RS)

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# Life Experiences and Teacher Knowledge:
# How a Content Teacher Decides to Use Literacy Strategies

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**Life Experiences and Teacher Knowledge:**
**How a Content Teacher Decides to Use Literacy Strategies**

Since the inception of content literacy methods courses, research has documented teacher resistance to the use of literacy strategies in secondary content classes (Conley, 1990; O'Brien, 1988; Ratekin, Simpson, Alvermann, & Dishner, 1985). O'Brien, Stewart, & Moje (1993) have argued that content literacy has been difficult to infuse into the secondary curriculum because attempts at infusion have proceeded in a top-down fashion that fails to account for the unique life experiences and contexts of secondary teachers and students.

Indeed, much research has been conducted on pre- and inservice teacher beliefs regarding the efficacy of content literacy strategies (Bean & Zulich, 1992; Stewart & O'Brien, 1989). Few studies, however, have investigated the evolution of experiences that influence beliefs and decision-making patterns. Although Holt-Reynold's (1992) study of personal history-based beliefs of preservice teachers represents a movement toward understanding instances of resistance, the mainstream of content literacy research in classrooms has concentrated on assessing teachers' practice in relationship to their current beliefs. Furthermore, studies have typically examined teacher's beliefs about content literacy by investigating beliefs about literacy or reading *per se* (e. g., Wilson, Konopak, & Readence, 1992) rather than by investigating how teachers' overall beliefs and experiences influence their decisions to use content literacy strategies (cf., Sturtevant, 1992). The existing research on content teachers' resistance to strategies instruction and the research on the inconsistency between teachers' beliefs and practices provide a foundation for diachronic and in-depth examination of content teachers' life experiences and values.

This paper reports on a portion of an ethnographic study that investigated the ways in which literacy was embedded in and shaped one high school science classroom (Moje &

Dillon, 1993). Findings of the larger study pointed to the teacher's philosophy of science as an influence on her choices of content literacy activities. This portion of the study examined the following questions: (a) What personal and professional life experiences have contributed to this teacher's beliefs about science and science teaching? (b) How do these experiences interact to affect the teacher's decisions about content literacy strategies?

These questions were based on the assertion that it is imperative to understand how teachers construct pedagogical knowledge bases if we wish to produce significant change in education (Butt, Raymond, & Yamagishi, 1988; Clandinin, 1985; Grimmett & MacKinnon, 1992; Shulman, 1987). Such understandings can be gained through life-course inquiry of teachers' lived experiences.(Goodson, 1992; Solas, 1992; Woods, 1987). Life-course inquiry can be conducted in from a variety of approaches, including autobiography (Butt, Raymond, & Yamagishi, 1988; Grumet, 1980; Pinar, 1980); biography (Butt & Raymond, 1987); narrative inquiry (Connelly & Clandinin, 1987); and life history (Goodson, 1980; King, 1991; Woods, 1987). These approaches provide insights for both teachers and researchers into the meaning of life experiences and the influences of those experiences on decisions made in current school contexts. As Butt & Raymond (1987) comment, "What teachers do and think within their professional lives depends . . . upon the meanings those individuals hold and interpret within their personal, social, and professional realities and everyday-life situations" (p. 71).

## Method

### Theoretical Framework and Methodology

The theoretical framework of hermeneutic phenomenology guided data collection, analysis, and interpretation in this study (van Manen, 1990). A hermeneutic

phenomenological perspective requires a recursive interpretation of the essence of an individual's lived experience (Patton, 1990; van Manen, 1990). Past experiences are interpreted in light of present experiences as a way of understanding the meaning and relevance of experiences in current contexts.

The use of case study methodology allowed for "an intensive, in-depth examination of one or a few instances of some phenomena" (Goetz & LeCompte, 1984, p. 46). In this instance, the phenomena were one teacher's personal and professional lived experiences. Because the case study was a portion of a larger ethnographic study, I was able to investigate the teacher's experiences in relation to classroom interactions and events.

Participant Roles and Data Sources

The participant, Dorothy Landy, a veteran teacher of sixteen years, taught chemistry and mathematics at Taft High School. The school of approximately 1300 students was located in a mid-size midwestern town. Before coming to Taft High School, Landy had taught both subjects in three quite different settings in the eastern United States.

Landy and I had been working together on a larger project for approximately 18 months. Data were collected over the 18-month period, during which I spent one year as a participant and observer in the second period chemistry class Landy taught. Our relationship was that of researcher and participant, although I shared the results of my analysis and interpretation with Landy on a regular basis as a means of checking the interpretations for validity.

According to Clandinin and Connelly (1993), participants' personal experiences can be investigated using several methods; in this study, the primary data sources were seven formal, semi-structured interviews and daily informal teacher interviews. Fieldnote observations and

audio/videotape transcriptions of daily lessons represented a secondary source of data; classroom interactions recorded in the fieldnotes and on tape were discussed during interviews. Three of the seven interviews focused specifically on biographical details, memorable experiences, and three questions that were derived from earlier interviews and other data sources. These questions included: (a) What does it mean to be a teacher? (b) What does it mean to respect someone or be respected? (c) What does it mean to care?

Data Analysis

Data analysis was accomplished by reflection on themes derived from the language used by the teacher as she described her life experiences. According to van Manen (1990), the discovery of themes is facilitated by a recursive approach to data analysis wherein the researcher reads all interview texts develops an overall theme statement. When the overall theme statement has been chosen, the researcher breaks the text into "clusters of meaning," or sub-themes. When the clusters have been analyzed, the researcher integrates theme statements into a narrative that interprets the participant's life experiences. In the process, the researcher moves recursively between multiple, triangulated data sources; narrative; and the participant in an attempt to construct a valid interpretation of the participant's life history.

## Results

The personal and professional experiences and values that have shaped Landy's beliefs about science, science teaching, and using literacy activities can be described by the theme "*doing what's right.*" Throughout our interviews, Landy talked frequently about her parents and family: "My parents, they gave me a sense of caring, caring about other people, and doing what's right." Landy believed that these values gave her an intuitive sense of what worked when teaching:

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> I think within the value system of our family there was always a value or an ethic to do your best. And never to hurt anybody. To always be good with people. And I think that's what carried us through. . . . I try to do the same thing with kids in my class.

As Landy explained in the above interview excerpt, she had learned the importance of respecting and caring about other people from her family. She recounted specific instances of what she called her father and mother's compassion for other people. These instances had impressed upon her the value of caring about and respecting others, regardless of their background or circumstances. As Landy stated, she brought this value to her work with the young people in her class.

When asked to expand on the phrase "doing what's right," Landy explained that she had been raised in the tradition of the Catholic church. She stated:

> We belonged to the Catholic church. . . . you always followed the teachings of the Church. Those are the guidelines, those are the things that kind of defined how we lived our life. They provided the context, the background.

To Landy, the guidelines of the Church provided rules for right and wrong action. According to Landy, these guidelines both defined and supported her family's values of caring for other people and being good to others.

As Landy recounted her experiences, she talked of *caring*, *respect*, *guidelines*, *and organization*. Each of these phrases is an element of Landy's belief that she should take right action, both as a teacher and as a human being. Furthermore, the theme of right action and its sub-themes--caring, respect, and guidelines--are threaded through all of Landy's unique experiences: her private liberal arts college education, her first years of teaching in New York Public Schools at the age of 18, and her most recent experiences teaching academic and honors high school chemistry.

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Specifically, the words *caring* and *respect* appear repeatedly in Landy's story. She talked often about her father's respect for education, the caring her teachers had shown, her respect and concern for her students and their respect for her, and administrators' and parents' respect for her teaching abilities. Whereas a dictionary definition of respect focuses on "deferential regard" and "esteem" (Landau, 1975), Landy's definition of respect centered on "appreciating a person for who he or she is." Landy believed that respect grew out of special relationships; thus, for Landy respect came from reaching out to people and helping them build self-esteem.

In her teaching, Landy appreciated her students, and she wanted them to appreciate her. Caring and respect for students and education led Landy to construct pedagogical learner knowledge (Grimmett & MacKinnon, 1992) that focused on facilitating students' learning (Moje, 1992). The following excerpts from three different interviews illustrate the importance Landy placed on her students' success:

> I've got the sense, intuitive sense of what I believe is good for kids. Because I look at myself and I say, "Would this be something that I'd like to be experiencing?" If I would say no, I certainly wouldn't give it to them. I look at each student the way he or she comes. I say, "How can I reach that student?"

> When I started teaching I taught very traditionally. I taught my subject. I taught all the facts. But I've learned over the years that I don't teach subjects, I teach students, and so I've geared my teaching toward helping them learn how to learn.

> Learning chemistry is secondary to learning skills and strategies for learning. I know that the majority of these kids aren't going to be scientists, so it's fruitless to shove facts down their throats. . . . My primary goal, overall, is to help students use literacy to learn how to learn chemistry.

As these three excerpts show, Landy chose teaching and learning strategies because she believed that by helping students learn how to learn, she was "doing what was right" for her

students. For Landy, learning how to learn was the key to being successful, and Landy clearly believed that content literacy strategies had the potential to help students learn how to learn.

Landy's comments in interviews were born out by classroom activities. For example, Landy believed that textbook readings were important because the readings provided a foundation for class discussions. However, she also knew that students often did not complete assigned readings, in part, because students had difficulty understanding science text. Consequently, Landy taught a strategy called SQ3R (Survey, Question, Read, Recite, Review [Robinson, 1941]) as a notetaking method for students to use when completing their readings. Landy could have easily provided the necessary foundation by lecturing about the assigned reading. Instead, she taught the strategy because she believed it would be more helpful for students than a lecture would be. She felt it would help them become independent learners. Thus, Landy's beliefs about respect and caring for people encouraged her to reach out to students by teaching them content literacy strategies, whereas many other content teachers reject the strategies as time-consuming, inappropriate to their content, or unnecessary for student learning.

Landy did not choose content literacy strategies blindly, however; she chose strategies that fostered organization in science thinking and learning, a choice that can be understood by interpreting other another sub-theme in Landy's life experiences: *guidelines and organization*. When asked about special teachers or mentors, Landy's spoke of her laboratory research mentor. She remarked that he "made the scientific method come alive," thus inspiring her. Her mention of this incident is especially insightful, for it exemplified Landy's belief about the nature of knowledge in science. Rather than focusing on the

discovery or exploration, Landy was inspired by the "scientific method," a series of steps for inquiry. In another interview, Landy referred to the periodic table of chemical elements as the ultimate symbol of science, again indicating her belief in "science as organization."

Landy's appreciation of the order she believed inherent in scientific inquiry was supported by the value she placed on organization in her life. That value stemmed from life experiences that emphasized doing what was right, according to the guidelines and rules taught by her family, the Church, and her mentor. For Landy, science, like life, was the application of organized methods and the search for patterns and regularities. In teaching science, then, Landy believed that organization was crucial, as she stated in this interview excerpt:

> I feel that organization is essential because you organize, and you get that down pat, and then you can deal with students. That's out of the way and then you don't have to worry about all of the little things that can happen in case you didn't properly.

This excerpt reveals the importance Landy placed on her own organization in teaching. She believed that organizing her lesson allowed her to "deal with students." For Landy, organization allowed her to maintain an orderly classroom in which she could interact with students on a more personal level. Her organization allowed her to reach students in two ways. First, Landy's focus on organization kept her classroom running smoothly, a quality appreciated by students (and parents and administrators). Specifically, students believed that Landy's organized teaching helped them learn more. Second, well-planned lessons allowed Landy to concentrate on students as opposed to content because she had organized the content concepts into a coherent framework. Thus, Landy could look for personal traits in students through which she could reach them and give them encouragement as they learned. For example, Landy was well known for her repartee with school athletes. She frequently used

sports analogies to drive home content concepts. Landy attributed her ability to tie students' interests into her chemistry teaching to her organization in lesson planning.

A second excerpt explicitly illustrates how organization figured into Landy's construction of pedagogical content and learner knowledges:

> As I heard [in a content literacy methods course] some of the ideas of organizing, things like that, I could visualize places in the curriculum where those could fit and would enhance what I do and would enhance the learning of my students.

Landy's reference to ideas of organizing highlights how Landy assessed new teaching and learning strategies. Landy was willing to incorporate literacy strategies into her chemistry classroom if she believed the strategies had the potential to foster organized thinking and learning. It is important to note, as well, that Landy evaluated potential strategies in terms of enhancing both what she did as a teacher and what her students would do as learners. As a result, Landy chose strategies such as the SQ3R strategy, Vee diagrams, notetaking strategies, and summary writing. Each strategy fostered and depended on organizational abilities and was designed to help students become independent learners (Moje & Dillon, 1993).

Landy felt that organization was also important for the students' learning, as illustrated by the following interview excerpt:

> They [students] have to organize when they use the SQ3R. They have to organize in a certain way. . . . So how do you take a chapter and condense it into just the main concepts . . . when they're beginning a chapter I have them just skim the chapter, just to get an idea. That's the first part of the SQ3R, just to get an idea what the chapter is, and then to make a statement. What's the whole chapter about and will you need more time to study? . . . So what I want them to do is to dig into it and get a complete answer.

The above excerpt illustrates the importance Landy placed on students' ability to organize their learning and studying. For example, when Landy said that she wanted students to be able to "take a chapter and condense it to main concepts," she stressed that it was important

for students to learn to organize their reading. In addition, Landy felt that students also needed to organize their studying, as illustrated in her question to students, "Will you need more time to study?". Landy's use of organizational literacy strategies to help students learn chemistry meshed with her notion of respect as "appreciating a person for whom he or she is." Landy recognized that her students did not possess the organizational abilities she believed they needed; thus, she taught them strategies to help them learn chemistry and to learn how to learn. She appreciated the abilities they did possess and tried to teach them new strategies.

These excerpts illustrate the emphasis Landy placed on organization as a key to good teaching and learning in science. Landy's emphasis on organization extended to her use of content literacy strategies, as is clear from the second and third excerpts. Such strategies fit with the pedagogical content knowledge that Landy had constructed based on her beliefs about the nature of knowledge in science and on her life experiences that emphasized following guidelines and organization as a means of "doing what's right."

## Conclusions and Implications

This study is important for content literacy teacher education and research because it represents an attempt to understand a teacher's decisions to incorporate content literacy strategies into her teaching in light of the teacher's past and present, personal and professional, life history. Landy taught literacy strategies because she cared about and respected her students; she chose organizational literacy strategies because those strategies matched her conception of science as organization. These findings are important in light of content literacy research that highlights resistance according to content affiliation (Gillespie & Rasinski, 1989; Hollingsworth & Teel, 1991). In the case of this teacher, content affiliation

is at work in her decisions to use literacy strategies, but life experiences and values have also shaped the nature of her pedagogical content knowledge (Shulman, 1987) and learner knowledge (Grimmett & MacKinnon, 1992). The results of this study, then, have implications for content literacy teacher education. Pre- and inservice teacher education programs should ask teachers to construct "autobiographical selves" (Butt, Raymond, & Yamagishi, 1988; Pinar, 1980, 1981). When individuals reflect on their own life histories and share their reflections with others in discussion, they begin to perceive and evaluate the complex factors that may influence their classroom decisions (King, 1991; Solas, 1992). In content literacy courses, such reflection and discussion may be crucial factors in attempts to encourage content teachers to incorporate literacy strategies into their pedagogy.

Moreover, the findings suggest that we need to closely examine the context of teachers' (and students') lives in order to make change in education. Studies of content area teaching have argued that teachers reject or accept literacy strategies because of cultural and institutional constraints (Alvermann & Moore, 1991; O'Brien & Stewart, 1992; Sturtevant, 1992). Landy represents a teacher whose life experiences have led her to construct beliefs about science and science teaching that encourage her to accept or modify certain strategies, while rejecting others. Landy's content literacy decisions were shaped by cultural and institutional factors, but these factors had accrued over a lifetime of experiences, and Landy did not always label these factors "constraints." Such findings raise a difficult question for literacy researchers and theorists interested in change and reform: If we find that some teachers' life experiences and beliefs do not support the value of content literacy strategies, how will we work with teachers to change these deeply rooted values and beliefs? This question is not easily answered; however, collaborative research, in which teachers and

researchers work together to understand unique experiences, values, and beliefs teachers bring to classrooms, may encourage reflection, action, and change among teachers and researchers.

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